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A GUIDE FOR SALVAGING WHITE PINE INJURED BY FOREST FIRES

White pine forests are severely damaged by forest fires. Generally a fire kills all trees less than 20 feet high immediately. Larger trees may die later, depending on the degree of injury. Salvage operations must be started soon after a fire, because insects and fungi quickly attack trees that are killed.

So when white pine lands burn, owners are faced with three questions: (1) Which white pine trees should be cut first? (2) Which trees should be left to produce seed? (3) Which trees will recover fully?

A Study Of Survival

Immediately after the forest fires that swept parts of southern Maine in October 1947, a study of fire-damaged trees on the Massabesic

Experimental Forest was started. One hundred twenty-two sample trees were selected for study in an attempt to find out the relationships among degree of injury, size of tree, and survival.

The trees selected for study were classed as <u>small</u> (2-6 inches in diameter), <u>medium</u> (7-11 inches), and <u>large</u> (12 inches or more). They represented four combinations of injury:

Root injury	Crown injury
Light	Light
Light	Heavy
Heavy	Light
Heavy	Heavy

Root injury was considered <u>light</u> if 25 percent or less of the visible roots were killed or severely injured. Injury was <u>heavy</u> if 75 percent or more of the major surface roots were killed or severely injured. Allowance was made for roots only partially damaged.

Crown injury was considered <u>light</u> if one-third or less of the crown was scorched. Injury was <u>heavy</u> if two-thirds or more of the crown was scorched. No trees were included that had their crowns entirely consumed by fire.

(The study was limited to trees that represented the extremes of damage: light or heavy. Trees with intermediate degrees of injury were not included.)

These sample trees have been examined every year since the fire. Table 1 shows the results to date.

Some Answers Are Appearing

In general, the larger the tree, the better its chance to survive fire. Smaller trees--6 inches and less in diameter at breast height--readily succumb to heavy injury of either roots or crown. In trees of all sizes, root injury seems to be more serious than crown injury.

When salvage priorities are set up, completely killed stands should be cut first. Next

Table 1.--Survival of white pine following fire

Degree of injury	Year	Survival by tree size		
		Large trees	Medium trees	Small trees
		Percent	Percent	Percent
Root injury light- Crown injury light	1947	100	100	100
	1948	100	90	90
	1949	100	90	70
	1950	75	80	70
Root injury light- Crown injury heavy	1947	100	100	100
	1948	100	77	50
	1949	86	69	20
	1950	86	54	20
Root injury heavy- Crown injury light	1947	100	100	100
	1948	70	50	20
	1949	70	50	0
	1950	60	40	--
Root injury heavy- Crown injury heavy	1947	100	100	100
	1948	78	36	10
	1949	33	27	10
	1950	22	27	10

are the stands where the root systems of all or most of the trees have been severely damaged; and stands of smaller trees should be given the highest priority. In stands where root injury was not heavy--and especially if crown injury was light--salvage cutting can be delayed at least 1 year.

Wherever possible, 25 or more trees per acre should be left as seed trees. White pine seed requires two growing seasons to mature and seed years generally occur at intervals of 3 to 5 years; so trees that have heavy root damage are poor risks for seed trees. The best seed trees to leave are those more than 12 inches d.b.h. that have only light root injury. Medium and small trees can also be left if root and crown injury is light.

--THOMAS W. McCONKEY and DONALD R. GEDNEY

SOME RECENT PUBLICATIONS

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Rettie, James C. *Forests and you.* Pa. Forests 36: 82. 1951.

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